

CONSOLIDATED'S LONG RANGER

THE USAAF PLACED ITS HOPE ON THE BOEING B-29 SUPERFORTRESS FOR THE DESTRUCTION OF JAPAN AND THE END OF THE WAR. THE USAAF KNEW THE BOMBERS WOULD NEED

VERY LONG-RANGE ESCORTS AND THE XP-81 WAS DEVELOPED TO FULFILL THAT ROLE

BY TERRY L. SUNDAY

The Consolidated Vultee (Convair) XP-81 long-range fighter was designed during the latter half of World War II, at a time when the concept of jet engines in aircraft was new. While the big fighter's intended mission was reasonably well defined, the technology of the early generation turbine engines was not. However, the lack of maturity of contemporary jet powerplants did not prevent Convair from designing a bold and unique aircraft that — despite failing to meet some of its performance requirements because of engine shortcomings — went on to become the first American turboprop-powered aircraft to fly.

The XP-81 was designed to fill the role of long-range bomber escort in the Pacific theater. The jet engines of the time appeared to offer considerable performance promise, and Convair's designers opted to take advantage of the jet's perceived, but undemonstrated, benefits rather than stick with such tried-and-true piston engines as the air-cooled 18-cylinder

der Pratt & Whitney R-2800 Double Wasp or the liquid-cooled 12-cylinder Rolls-Royce Merlin — power sources widely used in such early XP-81 contemporaries as the Republic P-47 and North American P-51 Mustang.

Today, with the United States in a pre-eminent position as the world's leading designer of advanced-technology turbine engines, it is difficult to appreciate that the nation nearly forfeited the jet engine race before it started. The US was a definite latecomer in the jet aircraft sweepstakes. The meager American activities during the mid-1930s focused on gas turbine uses for electric power and locomotives. A 1939 National Academy of Sciences study, sponsored by the US Navy, under-

scored the general impression that gas turbines were nothing special. Looking into the future of jet propulsion, the report concluded that, "while gas turbines might show some promise as warship powerplants (after all, the study was commissioned by the Navy), they would never be practical for aircraft applications because their components were far too bulky and heavy."

Coming out at about the same time as the world's first jet aircraft flight, the report quoted weight estimates that later proved to be wrong by a factor of between ten and 15! But the damage was done. Initially uncommitted, the US badly lagged behind both England and Germany, where development of aircraft jet engines had been underway along parallel lines for a number of years before the war (see "Meteor Versus the Luftwaffe" in the April issue). A common factor in all three countries in the late 1930s and early 1940s was an utter lack of government backing. In England and Germany, jet engine development proceeded — albeit slowly — without official sanction. Not so in America.

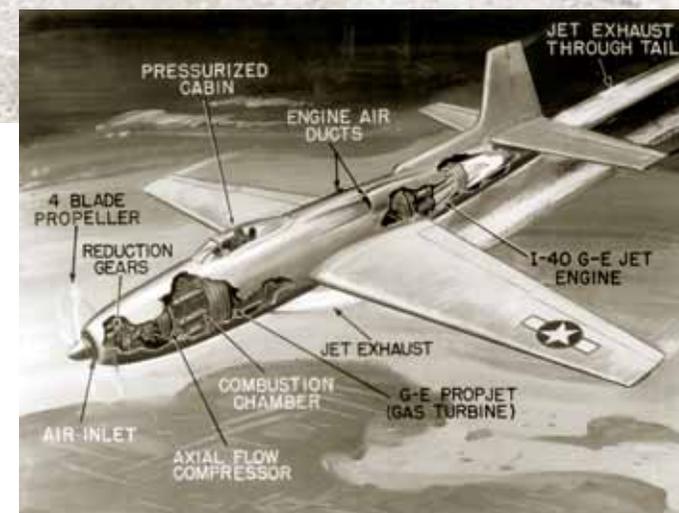
Scientists and engineers in both Germany and England began seriously to investigate the possibilities of jet-powered aircraft in 1936. The German efforts culminated in the flight of the world's first aircraft propelled purely by turbojet power. On 27 August 1939, the diminutive Heinkel He 178, powered by a 1100-lb thrust Heinkel HeS-3b centrifugal-flow turbojet, took to the air from Marienehe Airfield in Germany. The jet age began auspiciously as the tiny aircraft performed a series of successful and promising tests. However, the HeS-3b engine proved ill-suited for production, and German development efforts turned instead to axial-flow designs.



Sam Shannon flying the first XP-81 on 25 January 1946 with this characteristic four-leaf clover insignia added under the windscreen. During their testing time, both prototypes had minor paint changes. For example, the #1 aircraft has "Consolidated Vultee" painted on the nose and "Convair" on the vertical tail.



Fitted with the turboprop engine, XP-81 44-91000 was photographed in flight on 18 January 1945. This was Flight 53 and was made expressly for photographic purposes.



This illustration was created by Consolidated as a press release to illustrate the XP-81's various systems.

During the early flight tests, official disinterest in jet propulsion was prevalent in the high echelons of the RLM (*Reichsluftministerium*, or Air Ministry), sometimes bordering on outright hostility. But ultimately the RLM began actively to back the idea, and later German jet engine work focused on the BMW (*Bayerische Motoren Werke*) 003 and the Jumo (*Junkers Motoren Werke*) 004, both axial-flow turbojets.

In England, the basic design for the engine used in the first British and American jet aircraft — and the direct ancestor of one of two engines that powered the XP-81 — was patented in mid-1931 by Frank Whittle, a young Royal Air Force officer serving as a flying instructor at No. 2 Flying Training School in Digby, Lincolnshire. Whittle sought support to develop his design from industrial manufacturers and from organizations within the British defense establishment, but to no avail. The

